

## TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

21912.002US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/787686

INTERNATIONAL APPLICATION NO.

PCT/EP99/06855

INTERNATIONAL FILING DATE

16.September.1999

PRIORITY DATE CLAIMED

1.October.1998

TITLE OF INVENTION

METHOD AND DEVICE FOR MECHANICALLY TREATING CONCRETE BLOCKS

APPLICANT(S) FOR DO/EO/US

HAGENAH, Gerhard

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

## Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☒ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

First page of International Publication No. WO 00/20182  
Formal Figures (3 Sheets, 3 copies each)  
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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

INTERNATIONAL APPLICATION NO.

ATTORNEY'S DOCKET NUMBER

097787686

PCT/EP99/06855

21912.002US

21. The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1,000.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**\$860.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). ☐ 20 ☐ 30

**\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	22 - 20 =	2	x \$18.00	\$36.00
Independent claims	2 - 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable)			<input type="checkbox"/>	\$0.00

**TOTAL OF ABOVE CALCULATIONS =**

**\$896.00**

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐

**\$0.00**

**SUBTOTAL =**

**\$896.00**

Processing fee of **\$130.00** for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). ☐ 20 ☐ 30 +

**\$0.00**

**TOTAL NATIONAL FEE =**

**\$896.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☒

**\$40.00**

**TOTAL FEES ENCLOSED =**

**\$936.00**

Amount to be refunded	\$
charged	\$

- ☒ A check in the amount of **\$936.00** to cover the above fees is enclosed.
- ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- ☐ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. \_\_\_\_\_ A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

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**022870**

PATENT TRADEMARK OFFICE

SIGNATURE

Laurence P. Colton

NAME

33,371

REGISTRATION NUMBER

21 March 2001

DATE

09/787686

002 Rec'd PCT/PTO 21 MAR 2001

Patent  
Express Mail Label: EL773578071US  
Express Mail Date: 21 March 2001  
Customer No.: 022870  
Docket No.: 21912.002US

**PATENT COOPERATION TREATY  
UNITED STATES PATENT AND TRADEMARK OFFICE  
UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)**

Applicant: HAGENAH, Gerhard

Art Unit:

Application No.:

Examiner:

Filing Date:

Title: METHOD AND DEVICE FOR  
MECHANICALLY TREATING  
CONCRETE BLOCKS

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Box PCT  
Washington DC 20231

21 March 2001  
Atlanta GA 31156-7685

Sir:

Prior to examining the above-identified and enclosed patent application,  
please amend it as follows.

**IN THE SPECIFICATION**

Page 1, line 4, delete "Description" and replace with:

**--BACKGROUND OF THE INVENTION**

**1. Technical Field.--**

Page 1, line 11, insert:

**--2. Prior Art.--**

Page 2, line 4, insert:

**--BRIEF SUMMARY OF THE INVENTION--**

Page 3, line 19, insert:

**--BRIEF DESCRIPTION OF THE DRAWINGS--**

Page 4, line 5, insert:

**--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--**

**IN THE CLAIMS**

Claim 1, lines 4-5, delete "- block group (15) -" and replace with --forming a block group (15)--.

Claim 1, lines 5-6, delete "- transverse edges (11), longitudinal edges (12) -" and replace with --(11, 12)--.

Claim 1, line 8, delete "and/or" and replace with --and--.

Claim 3, line 1, delete "or 2".

Claim 3, lines 2-3, delete "or the block group (15) are/is" and replace with --are--.

Claim 3, line 4, delete "a preferably" and replace with --an--.

Claim 4, lines 1-2, delete "or one of the further claims".

Claim 4, lines 3-4, delete ", in particular of a table top".

Claim 4, lines 4-5, delete "or the block group (15)".

Claim 4, line 5, delete "their/its" and replace with --their--.

Claim 4, line 7, delete "(all the)".

Claim 4, lines 7-8, delete "- transverse edges (11) and longitudinal edges (12) -" and replace with --(11, 12)--.

Claim 5, lines 1-2, delete "or one of the further claims".

Claim 5, line 5, delete "and/or" and replace with --,--.

Claim 5, line 6, delete "and/or" and replace with --and--.

Claim 5, lines 8-9, delete "preferably in a mechanical manner".

Claim 6, lines 1-2, delete "or one of the further claims".

Claim 6, lines 3-5, delete "in particular following treatment for approximately 24 h in drying chambers,".

Claim 6, lines 7-8, delete "preferably in stacks of a plurality of block layers (24) one above the other,".

Claim 7, lines 4-5, delete "in particular table top (14),".

Claim 7, line 9, delete ", in particular imbricated or sawtooth-form".

Claim 7, line 12, delete "(15)" and replace with --(17)--.

Claim 8, line 2, after "side", insert --(15)--.

Claim 8, line 3, delete "table top (15)" and replace with --base--.

Claim 8, line 3, delete "preferably fixed elevations or".

Claim 8, lines 4-5, delete "concrete block" and replace with --of the concrete blocks--.

Claim 9, line 1, delete "or 8".

Claim 9, line 2, delete "the" and replace with --a--.

Claim 9, line 6, delete "preferably".

Claim 10, lines 1-2, delete "or one of the further claims".

Claim 10, lines 2-3, delete "it is possible to tilt".

Claim 10, lines 3-4, delete "or the table top (14)" and replace with --can be tilted--.

Claim 10, lines 6-7, delete "it being possible preferably for" and replace with --wherein--.

Claim 10, line 8, delete "to" and replace with --can--.

Claim 11, lines 1-2, delete "or one of the further claims".

Claim 11, lines 5-7, delete ", namely of a plurality of block layers (24) each corresponding to a base board (25) of a block-forming machine (23)"

Claim 12, lines 1-2, delete "or one of the further claims".

Claim 12, line 3, after "on", insert --at least one--.

Claim 12, line 4, delete "the drying chambers" and replace with --at least one drying chamber--.

Claim 12, line 5, after "the", insert --at least one--.

Claim 13, lines 1-2, delete "or one of the further claims".

Claim 13, line 3, delete "(tiltable)".

Claim 13, line 4, delete "preferably".

Claim 13, lines 5-7, delete ", namely by a cross-sectionally approximately U-shaped or V-shaped collecting trough (20)".

Please add new Claims 14 - 20 as follows:

14. (new) The method as claimed in claim 2, characterized in that the concrete blocks (10) are located in an inclined plane with a preferably alternating direction of inclination, and in that the treatment bodies (17) are moved over the concrete blocks (10) under their own weight with the rolling or sliding action.

15. (new) The method as claimed in claim 4, characterized in that the base is a table top (14).

16. (new) The method as claimed in claim 5, characterized in that the concrete blocks (10) are laid in a mechanical manner.

17. (new) The method as claimed in claim 6, characterized in that the curing of the concrete is a treatment for approximately 24 h in drying chambers.

18. (new) The method as claimed in claim 6, characterized in that the concrete blocks (10) are stored in stacks of a plurality of block layers (24) one above the other.

19. (new) The method as claimed in claim 7, characterized in that the concrete blocks (10) are offset in imbricated or sawtooth-form.

20. (new) The method as claimed in claim 8, characterized in that the base is a table top.

21. (new) The method as claimed in claim 11, characterized in that the production units of concrete blocks (10) are a plurality of block layers (24) each corresponding to a base board (25) of a block-forming machine (23).

22. (new) The method as claimed in claim 13, characterized in that the apparatus for collecting the treatment bodies (17) is a collecting trough having a cross-section selected from the group consisting of U-shaped and V-shaped cross-sections.

### **REMARKS**

The Specification and Claims have been amended to comport with the style preferred by the United States Patent and Trademark Office (USPTO). No new matter has been added in these amendments.

New Claims 14-22 have been added to recoup the subject matter removed by the amendments to the original claims. No new matter has been added.

### **CONCLUSION**

Applicant submits that the patent application is in proper condition for examination and requests such action. If the examiner has any questions that can be addressed over the telephone, the examiner is invited to contact the below-signed attorney.

Respectfully submitted,  
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## CLAIMS AS AMENDED

Applicant: Hagenah, Gerhard

Customer No.: 022870

Title: Method And Device For Mechanically  
Treating Concrete Blocks

Docket No.: 21912.002US

1. A method of mechanically treating concrete blocks by the irregular removal of fragments in the region of edges and corners, characterized in that a group of concrete blocks (10) forming a block group (15) is positioned on a base such that top edges (11, 12) and corners are at least temporarily exposed and, offset in relation to the respectively adjacent concrete blocks (10), project beyond these adjacent concrete blocks, and in that treatment bodies (17) are moved over the thus arranged block group (15) in order to treat the projecting edges and corners.

2. The method as claimed in claim 1, characterized in that the concrete blocks (10) within the block group (15) are offset in relation to one another in an imbricated manner or in sawtooth form, preferably with alternating relative positions.

3. The method as claimed in claim 1, characterized in that the concrete blocks (10) are located in an inclined plane with an alternating direction of inclination, and in that the treatment bodies (17) are moved over the concrete blocks (10) under their own weight with rolling or sliding action.

4. The method as claimed in claim 1, characterized in that by changing the inclination of the base (14), the concrete blocks (10) can be moved, under their own weight, into different imbricated or sawtooth-form relative positions such that edges (11, 12) alternately move into a position appropriate for treatment.

5. The method as claimed in claim 1, characterized in that the concrete blocks (10) within the block group (15) are positioned relative to one another in a manner appropriate for storage, transportation and for laying within a paving arrangement and, once the edges and corners have been treated, are transported away, and laid, without any change in position relative to one another.

6. The method as claimed in claim 1, characterized in that following the curing of the concrete, concrete blocks (10) are subjected to mechanical treatment and are then stored, in order to set fully.

7. An apparatus for mechanically treating concrete blocks (10) by the irregular removal or knocking off fragments in the region of edges and corners, characterized by a base for positioning a block group (15) comprising a plurality of



concrete blocks (10) located one beside the other, the concrete blocks (10) of the block group (15) being in vertically offset positions relative to one another, and in that, for the mechanical treatment, treatment bodies (17) can be moved over the top side of the block group (15).

8. The apparatus as claimed in claim 7, characterized in that arranged on the top side (15) of the base are supporting ridges (21) which are assigned to each of the concrete blocks (10) and on which the concrete blocks (10) are positioned eccentrically in each case in order to produce a sawtooth-form surface of the block group (15).

9. The apparatus as claimed in claim 7, characterized in that a table top (14) of a treatment table (13) is enclosed all the way round by a border surround (16), the block group (15) being positioned within the border surround (16) such that, when the table top (14) is inclined in one direction or the other, the concrete blocks (10) of the block group (15) can be moved relative to the fixed supporting ridges (21) into different oblique positions.

10. The apparatus as claimed in claim 7, characterized in that the treatment table (13) can be tilted for the movement of the treatment bodies (17) in order to provide an inclination of the table top (14) and of the block group (15), wherein the table top (14) can be tilted with different directions of inclination.

11. The apparatus as claimed in claim 7, characterized in that the block group (15) on the table top (14) is made up of a plurality of production units of concrete blocks (10).

12. The apparatus as claimed in claim 7, characterized in that concrete blocks (10) on at least one base board (25), following a curing operation in at least one drying chamber (28), can be pushed directly from the at least one base board (25) and conveyed onto the treatment table (13).

13. The apparatus as claimed in claim 7, characterized in that the treatment table (13) is enclosed all the way round by an apparatus for collecting the treatment bodies (17).

14. The method as claimed in claim 2, characterized in that the concrete blocks (10) are located in an inclined plane with a preferably alternating direction of inclination, and in that the treatment bodies (17) are moved over the concrete blocks (10) under their own weight with the rolling or sliding action.

15. The method as claimed in claim 4, characterized in that the base is a table top (14).

16. The method as claimed in claim 5, characterized in that the concrete blocks (10) are laid in a mechanical manner.

17. The method as claimed in claim 6, characterized in that the curing of the concrete is a treatment for approximately 24 h in drying chambers.

18. The method as claimed in claim 6, characterized in that the concrete blocks (10) are stored in stacks of a plurality of block layers (24) one above the other.

19. The method as claimed in claim 7, characterized in that the concrete blocks (10) are offset in imbricated or sawtooth-form.

20. The method as claimed in claim 8, characterized in that the base is a table top.

21. The method as claimed in claim 11, characterized in that the production units of concrete blocks (10) are a plurality of block layers (24) each corresponding to a base board (25) of a block-forming machine (23).

22. The method as claimed in claim 13, characterized in that the apparatus for collecting the treatment bodies (17) is a collecting trough having a cross-section selected from the group consisting of U-shaped and V-shaped cross-sections.

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## Method and device for mechanically treating concrete blocks

## Description

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The invention relates to a method of mechanically treating concrete blocks by the irregular removal of fragments in the region of edges and corners. The invention also relates to an apparatus for implementing the method.

10

Concrete blocks, in particular concrete paving blocks, are frequently subjected to mechanical treatment in which edges and corners of the concrete blocks are irregularly knocked off. The intention is thus for the concrete blocks to achieve the outer appearance of an (artificially) aged block.

15

The method of artificially aging concrete blocks which has been used in practice up until now consists in the finished, set concrete blocks which have been cured fully by corresponding storage being moved through a rotating drum. In this case, corners and edges are irregularly knocked off within the drum, to be precise by reciprocal mechanical treatment of the blocks, but also by the latter striking against the drum wall (so-called tumbling of concrete blocks).

20

25

The tumbling method is associated with the considerable development of noise and dust. It is also disadvantageous that the treated concrete blocks occur as bulk goods, that is to say they leave the drum in a disordered formation. This makes further processing of the concrete blocks more difficult, in particular in the case of mechanical laying of the concrete blocks for producing paving. In this case, the disordered blocks have to be positioned and stacked manually, with

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corresponding outlay, for the purpose of producing formations in order to be able to be transported to the construction site in a manner appropriate for laying.

- 5 The object of the invention is to improve a method of, and an apparatus for, mechanically treating the paving blocks in order to make available concrete-blocked units which can be processed with a low level of aggravating noise and dust being produced.

10

In order to achieve this object, the method according to the invention is characterized in that a group of the concrete blocks - block group - is positioned on a base such that top edges and corners are at least temporarily exposed and/or, offset in relation to the respectively adjacent concrete blocks, project beyond these adjacent concrete blocks, and in that treatment bodies are moved over the thus arranged group of concrete blocks in order to treat the projecting edges and corners mechanically.

20

According to the invention, the concrete blocks are at rest during the treatment, but are positioned relative to one another such that edges and corners are exposed as upwardly directed projections, with the result that treatment bodies moved over the top side of the block group can remove the relevant edges and corners irregularly.

25

- 30 The block group is preferably positioned in an inclined plane, the treatment bodies being moved over the concrete blocks, which are offset in an imbricated manner, under their own weight with rolling or sliding action. The base for the block group, in particular a treatment table, is movable, with the result that the concrete blocks can be arranged in an imbricated manner in different positions relative to one another in order for all the edges in the region of a top side of the concrete blocks to be treated.

35

The block group treated in this way comprises concrete blocks which are positioned relative to one another in a manner necessary for the storage and/or the transportation and/or mechanical laying as paving blocks. A block group may thus comprise a transporting and laying unit or a plurality of units positioned one beside the other.

10

According to a further proposal of the invention, the operation of mechanically treating the concrete blocks is integrated in the production process of the same. Following setting in the region of the drying chambers, the concrete blocks are fed directly to the mechanical-treatment apparatus according to the invention. Intermediate storage in order to be cured fully is dispensed with.

15

Further details of the method according to the invention and of the apparatus are explained more specifically hereinbelow with reference to the drawings, in which:

25 Figure 1 shows a schematic plan view of an apparatus for mechanically treating concrete blocks,

Figure 2 shows a side view or cross section of the apparatus according to figure 1 in an oblique position,

30

Figure 3 shows the apparatus according to figures 1 and 2 in another position,

35 Figure 4 shows, on an enlarged scale, a detail of the apparatus according to figure 2,

Figure 5 shows, likewise on an enlarged scale, a detail of figure 3, and

Figure 6 shows a schematic plan view of an installation for producing concrete blocks with a mechanical-treatment arrangement.

5

The drawings show the treatment of concrete blocks 10. The latter are cuboidal green blocks which are to be used as paving blocks, that is to say for forming a ground covering. The concrete blocks 10 may be of any  
10 desired configuration for the treatment, that is to say they may also be provided with protrusions and depressions in order to achieve a horizontal or vertical interlocking arrangement.

15 The concrete blocks 10 are treated mechanically so as to give the appearance of artificial aging. Primarily, for this purpose, edges and corners of the concrete blocks 10 are treated by way of material (concrete) being knocked off irregularly. This treatment is  
20 carried out such that all the concrete blocks are configured differently, that is to say there is no correspondence between the break-off points.

A special feature resides in the fact that, in the case  
25 of the treatment method illustrated, the concrete blocks 10 are treated mechanically merely in the region of a top side. It is thus the case that only top transverse edges 11 and longitudinal edges 12 have material removed from them irregularly by mechanical  
30 elements. In a paving arrangement made of concrete blocks 10 treated in this way, said transverse edges 11 and longitudinal edges 12 which are provided with break-off points are likewise located on the (visible) top side of the paving. The bottom regions and edges of  
35 the concrete blocks 10, which are located in the ground, thus remain untreated, with the result that spacers provided, for example, even on upright side surfaces are not adversely affected.

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For the treatment of the concrete blocks 10, the latter are positioned on a base, to be precise in a formation which corresponds to the arrangement of the concrete blocks 10 in the region of the paving. This arrangement of the concrete blocks 10 also expediently corresponds to that in a stack of concrete blocks 10. The concrete blocks 10 for producing paving are usually stacked in layers on pallets. The arrangement of the concrete blocks 10 within a layer corresponds to that during the mechanical treatment. It is expedient for in each case one layer of a stack of concrete blocks 10 to be a laying unit, that is to say a group of concrete blocks 10 which a machine can lay mechanically as a unit.

15 The concrete blocks 10 are arranged in this formation on a treatment table 13. The latter is provided with a table top 14 as a bearing means for a group of concrete blocks 10, namely for a block group 15. The table top 14 is an essentially planar load-bearing element with an encircling border surround 16 for the concrete blocks 10 or the block group 15. The table top 14 or the bearing surface defined by the border surround 16 is dimensioned such that it is possible to displace the concrete blocks 10 of the block group 15 as a unit within the border surround 16 on the table top 14. In order to treat the concrete blocks 10 in the manner described, treatment bodies 17 are moved over the (free) top side of the concrete blocks 10 on the table top 14. A sufficient number of such treatment bodies 17 are moved back and forth, if appropriate a number of times, over the top side of the concrete blocks 10 without guidance, the treatment bodies 17 executing a rolling or sliding action, in some cases being briefly raised up from the top side of the concrete blocks 10 in the process.

The treatment bodies 17 may consist of different materials, albeit of a material which is harder than concrete. For example, the treatment bodies 17 may be

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formed from granite, that is to say they may be granite blocks with corners and edges. Alternatively, it is also possible for the treatment bodies 17 to consist of metal. Different types of treatment bodies 17 may be used together in order to achieve corresponding treatment effects.

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All the treatment bodies 17 are moved over the top side of the concrete blocks 10, with their own weight being utilized in the process. For this purpose, the block group 15 is moved into an inclined position, to be precise by a corresponding tilting movement of the table top 14. Said table top may be expediently be tilted with different inclinations in time with the operating procedure. The maximum inclination of the table top 10 and/or of the block group 15 may be 40° or up to 45°. In this end-inclination position, all the treatment bodies 17 are moved from one side of the block group 15, over the latter, to the other side. In the exemplary embodiment shown, the corresponding tilting movement of the table top 14 is executed with the aid of pressure-medium cylinders 18, 19. The tilting movement may be executed in a number of directions, that is to say in the longitudinal direction and transverse direction in relation to the treatment table 13.

The material for treating the concrete blocks 10, that is to say the treatment bodies 17, is/are used a number of times in each case, that is to say is/are thus part of the treatment apparatus. For this purpose, the treatment table 13 is enclosed all the way round by a collecting trough 20. The latter is in the form of U-shaped or similarly shaped collecting parts which are fastened on the border of the treatment table 13 or on the border surround 16. That part of the collecting trough 20 which is respectively at the bottom when the table top 14 is in the oblique position collects the treatment bodies 17 if these have been moved over the



block group 15. By virtue of movement into the other tilting position, the treatment bodies 17 are then moved over the block group 15 again and collected by the part of the collecting trough 20 on the opposite side.

For effective treatment of the concrete blocks 10, the latter are positioned in a specific manner relative to one another during the treatment, that is to say when the treatment bodies 17 are moved over the concrete blocks 10. In this case, the concrete blocks 10 are arranged in an offset position in relation to one another such that at least some of the (top) edges, namely transverse edges 11 and longitudinal edges 12, project beyond adjacent concrete blocks 10. In the present exemplary embodiment, the concrete blocks 10 are offset in relation to one another in an imbricated manner or in sawtooth form. As a result, transverse edges 11 respectively project to a considerable extent beyond the top surface of the adjacent concrete block 10 (figures 4 and 5). These regions of the concrete blocks 10 thus form resistances or elevations in relation to the treatment body 17 moved over the block group 15. This results in regions being knocked irregularly out of the edges.

In order for all the top edges all the way round, namely transverse edges 11 and longitudinal edges 12, to be treated in this manner, there has to be a change in position of the concrete blocks 10 relative to one another. This can be brought about by movable elements which raise or lower the concrete blocks 10 into alternating positions. In the present exemplary embodiment, the concrete blocks 10 move automatically into offset treatment positions. For this purpose, supporting elements for the concrete blocks, namely supporting ridges 21, are arranged on the top side of the table top 14. In the present case, the supporting ridges are arranged in a fixed manner, to be precise

such that each concrete block 10 rests eccentrically, and thus obliquely, on a supporting ridge 21. When the table top 14 is tilted into another, opposite oblique position, the concrete blocks slide along the supporting ridges 21, by way of their underside, into another, opposite oblique position, with the result that the transverse edges 11 which are at a lower level in figure 4 move into an elevated position in which they project beyond the adjacent concrete block 10. The supporting elements may be designed and arranged such that corresponding oblique positions are achieved with transversely directed tilting movements of the treatment table 13.

15 In the present example, the concrete blocks 10 are arranged in block rows 22 within the block group 15. The supporting ridges 21 are arranged such that in each case a complete block row 22 is positioned in the manner illustrated in figures 4 and 5.

20 The abovedescribed treatment apparatus and the treatment process may advantageously be integrated in the process of producing concrete blocks 10. Figure 6 shows a schematic plan view of a block-production installation. The latter comprises a block-forming machine 23. In the region of the latter, in each case one layer of concrete blocks 10, that is to say a block layer 24, is produced on a base board 25. The newly produced concrete blocks 10, that is to say the block layer 24, is conveyed, on this base board 25, into the region of a lifting ladder 26. The latter stacks the base boards 25 with in each case one block layer 24 one above the other. A unit comprising a plurality of base boards 25 is then received by a fork-lift truck 27 and transferred to one of a number of drying chambers 28. In the region of the latter, the concrete blocks cure under the action of heat. The concrete blocks 10 remain in the drying chambers 28 for a duration of approximately 24 h. Thereafter, the fork-lift truck 27 removes the

set concrete blocks 10 - on the base boards 25 - from the drying chambers 28. In the region of a lowering ladder 29, the base boards 25, with in each case one block layer 24, are separated again and conveyed in the direction of a destacker 30. The latter removes the set concrete blocks 10 or the block layer 24 from the base board 25. The concrete blocks are fed, via a conveyor 31, to a storage area in order to be cured fully over a period of from 8 to 10 days. The emptied base boards 25 are fed to the block-forming machine 23 again.

In the present exemplary embodiment, the concrete blocks 10 cured over 24 h, rather than being conveyed directly to the storage area, are removed from the base boards 25 via a preliminary stacker 32. A transverse conveyor 33 feeds the concrete blocks 10, namely the block layers 24, to the treatment station, that is to say the treatment table 13. The dimensions here are selected such that a plurality of block layers 24 together form a block group 15 on the treatment table 13. The treated concrete blocks 10 are pushed off the treatment table 13 again, onto a removal conveyor 34, expediently in sub-groups - corresponding to a block layer 24. Said removal conveyor transports the concrete blocks 10 to a storage area for curing purposes. The abovedescribed treatment of the concrete blocks 10 in order to produce artificial aging is, accordingly, carried out before the concrete has set fully, that is to say following a curing process of approximately 24 h. The operations of transferring the block layers 24 to the treatment table 13 and of pushing the treated concrete blocks 10 off may expediently take place such that the incoming concrete blocks 10 or block layers 24 which are to be treated push off from the table top 14, onto the removal conveyor 34, those concrete blocks or block layers which have already been treated.

List of designations

- 10 Concrete block
- 11 Transverse edge
- 12 Longitudinal edge
- 13 Treatment table
- 14 Table top
- 15 Block group
- 16 Border surround
- 17 Treatment body
- 18 Pressure-medium cylinder
- 19 Pressure-medium cylinder
- 20 Collecting trough
- 21 Supporting ridge
- 22 Block row
- 23 Block-forming machine
- 24 Block layer
- 25 Base board
- 26 Lifting ladder
- 27 Fork-lift truck
- 28 Drying chamber
- 29 Lowering ladder
- 30 Destacker
- 31 Conveyor
- 32 Preliminary stacker
- 33 Transverse conveyor
- 34 Removal conveyor

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## Patent Claims

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1. A method of mechanically treating concrete blocks by the irregular removal of fragments in the region of edges and corners, characterized in that a group of concrete blocks (10) - block group (15) - is positioned on a base such that top edges - transverse edges (11), longitudinal edges (12) - and corners are at least temporarily exposed and/or, offset in relation to the respectively adjacent concrete blocks (10), project beyond these adjacent concrete blocks, and in that treatment bodies (17) are moved over the thus arranged block group (15) in order to treat the projecting edges and corners.
2. The method as claimed in claim 1, characterized in that the concrete blocks (10) within the block group (15) are offset in relation to one another in an imbricated manner or in sawtooth form, preferably with alternating relative positions.
3. The method as claimed in claim 1 or 2, characterized in that the concrete blocks (10) or the block group (15) are/is located in an inclined plane with a preferably alternating direction of inclination, and in that the treatment bodies (17) are moved over the concrete blocks (10) under their own weight with rolling or sliding action.
4. The method as claimed in claim 1 or one of the further claims, characterized in that by changing the inclination of the base, in particular of a table top (14), the concrete blocks (10) or the

block group (15) can be moved, under their/its own weight, into different imbricated or sawtooth-form relative positions such that (all the) edges - transverse edges (11) and longitudinal edges (12) - alternately move into a position appropriate for treatment.

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5. The method as claimed in claim 1 or one of the further claims, characterized in that the concrete blocks (10) within the block group (15) are positioned relative to one another in a manner appropriate for storage and/or transportation and/or for laying within a paving arrangement and, once the edges and corners have been treated, are transported away, and laid preferably in a mechanical manner, without any change in position relative to one another.
  6. The method as claimed in claim 1 or one of the further claims, characterized in that following the curing of the concrete, in particular following treatment for approximately 24 h in drying chambers, concrete blocks (10) are subjected to mechanical treatment and are then stored, preferably in stacks of a plurality of block layers (24) one above the other, in order to set fully.
  7. An apparatus for mechanically treating concrete blocks (10) by the irregular removal or knocking off fragments in the region of edges and corners, characterized by a base, in particular table top (14), for positioning a block group (15) comprising a plurality of concrete blocks (10) located one beside the other, the concrete blocks (10) of the block group (15) being in vertically offset, in particular imbricated or sawtooth-form positions relative to one another, and in that, for the mechanical treatment, treatment bodies

(15) can be moved over the top side of the block group (15).

8. The apparatus as claimed in claim 7, characterized  
5 in that arranged on the top side of the table top  
(15) are preferably fixed elevations or supporting  
ridges (21) which are assigned to each concrete  
block (10) and on which the concrete blocks (10)  
10 are positioned eccentrically in each case in order  
to produce a sawtooth-form surface of the block  
group (15).
9. The apparatus as claimed in claim 7 or 8,  
15 characterized in that the table top (14) of a  
treatment table (13) is enclosed all the way round  
by a border surround (16), the block group (15)  
being positioned within the border surround (16)  
preferably such that, when the table top (14) is  
inclined in one direction or the other, the  
20 concrete blocks (10) of the block group (15) can  
be moved relative to the fixed supporting ridges  
(21) into different oblique positions.
10. The apparatus as claimed in claim 7 or one of the  
25 further claims, characterized in that it is  
possible to tilt the treatment table (13) or the  
table top (14) for the movement of the treatment  
bodies (17) in order to provide an inclination of  
the table top (14) and of the block group (15), it  
30 being possible preferably for the table top (14)  
to be tilted with different directions of  
inclination.
11. The apparatus as claimed in claim 7 or one of the  
35 further claims, characterized in that the block  
group (15) on the table top (14) is made up of a  
plurality of production units of concrete blocks  
(10), namely of a plurality of block layers (24)

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each corresponding to a base board (25) of a block-forming machine (23).

- 5 12. The apparatus as claimed in claim 7 or one of the further claims, characterized in that concrete blocks (10) on base boards (25), following a curing operation in the drying chambers (28), can be pushed off directly from the base board (25) and conveyed onto the treatment table (13).
- 10 13. The apparatus as claimed in claim 7 or one of the further claims, characterized in that the (tiltable) treatment table (13) is enclosed preferably all the way round by an apparatus for collecting the treatment bodies (17), namely by a
- 15 cross-sectionally approximately U-shaped or V-shaped collecting trough (20).

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# Abstract

in conjunction with figure 2

Method of, and apparatus for, treating concrete blocks (10) in order to carry out an artificial aging process. For the mechanical treatment of the concrete blocks (10), the latter are positioned in a desired formation on a table top (14). Treatment bodies (17) are moved over the top side of the concrete blocks (10) with the table top (14) inclined. In this case, the concrete blocks (10) are arranged obliquely relative to one another, with the result that projecting edges and corners are partially removed.

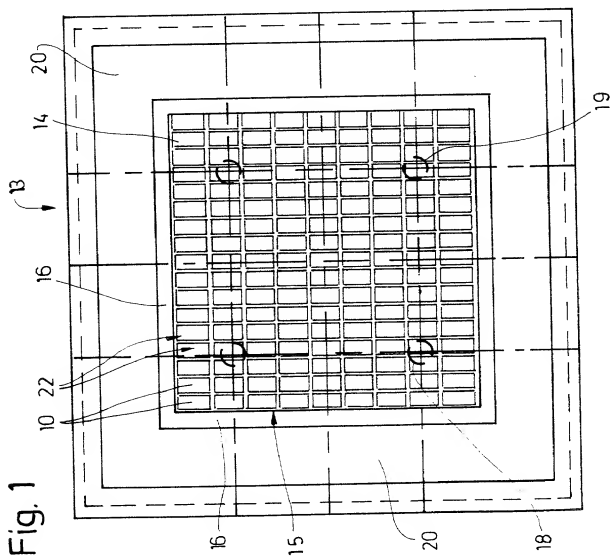


Fig. 1

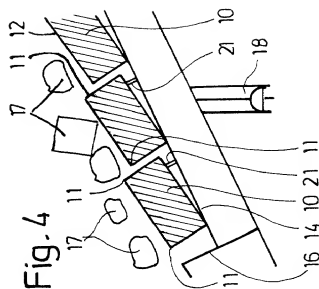


Fig. 4

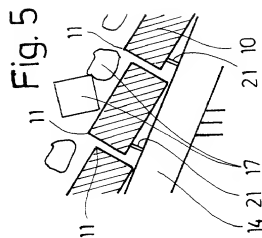


Fig. 5

Fig. 2

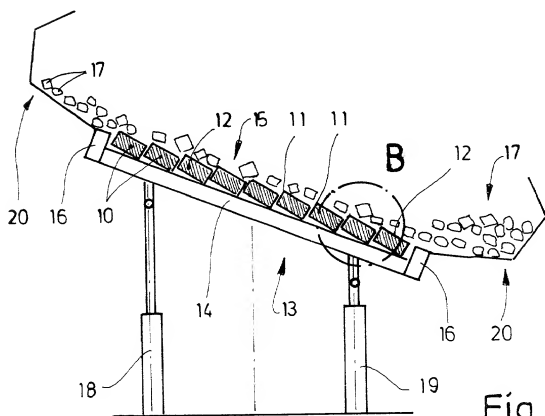
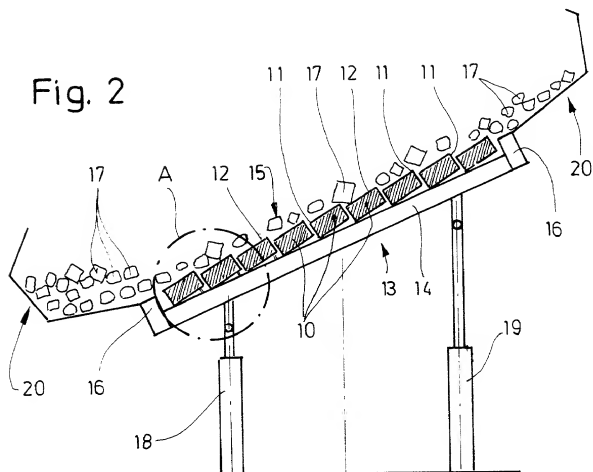
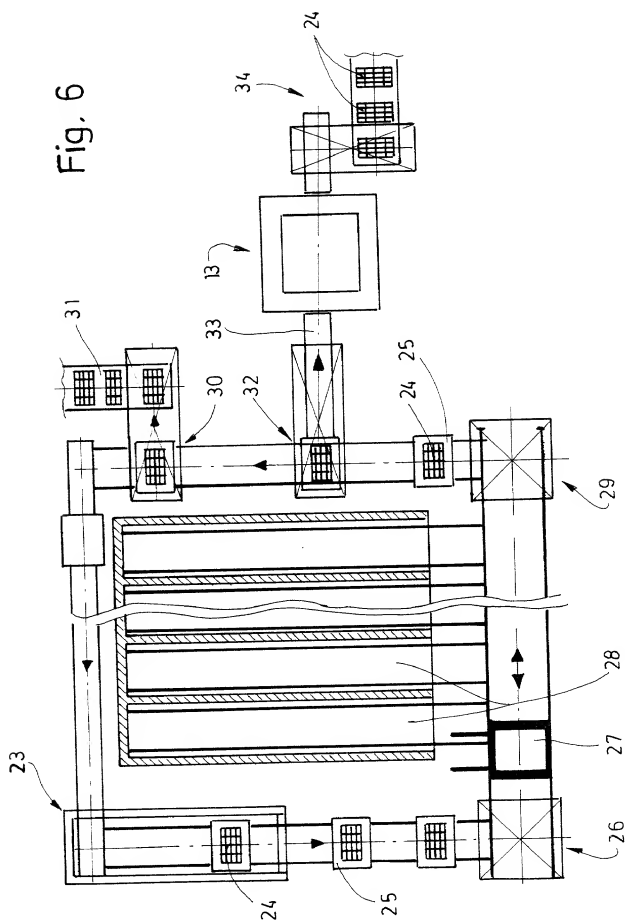


Fig. 3

Fig. 6



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# DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION

☒ Declaration Submitted with Initial Filing **OR** ☐ Declaration Submitted after Initial Filing

Attorney Docket Number	21912.002US
First Named Inventor	Hagenah, Gerhard
<b>COMPLETE IF KNOWN</b>	
Application Number	
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD AND DEVICE FOR MECHANICALLY TREATING CONCRETE BLOCKS

(Title of the invention)

the specification of which

☐ is attached hereto  
OR

☒ was filed on (MM/DD/YYYY) 09/16/99 as United States Application Number or PCT International

Application Number EP99/06855 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, § 1.55.

I hereby claim foreign priority benefits under Title 35, United States Code § 119 (a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365 (a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO
198 45 174.1	Germany	10/01/98	<input type="checkbox"/>	<input type="checkbox"/>
PCT/EP99/06855	PCT	09/16/99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

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[Page 1 of 2]

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U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

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Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

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☐ Additional inventors are being named on the \_\_\_\_\_ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto